

PYRORCHIS, A NEW GENUS OF ORCHIDACEAE FROM AUSTRALIA

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ABSTRACT

Pyrorchis is described for two species of Australian Orchidaceae previously placed in *Lyperanthus* R. Br. with *Lyperanthus nigricans* R. Br. as the type. The genus differs from *Lyperanthus* in its fire-induced flowering habit, ground-hugging, amphistomatic, broadly ovate to orbicular leaves which are pellucid adaxially and lack incurved or involute margins.

KEY WORDS: Orchidaceae, *Lyperanthus*, *Pyrorchis*, new genus

The orchidaceous genus *Lyperanthus* R. Br. currently contains five species, four endemic to Australia (Clements 1989) and another in New Zealand (Moore & Edgar 1970). In preparing an account of *Lyperanthus* and allied genera from Australia, New Zealand, and New Caledonia, in relation to their tribal and subtribal placement (Jones & Clements in prep), the question of disparity with the genus *Lyperanthus* came to light. The opportunity is taken here to solve this problem in the Australian species by the description of a new genus. The relationship between the New Zealand species, *L. antarcticus* J.D. Hook., and the Australian species of *Lyperanthus* is somewhat obscure and will be the subject of a separate paper.

The four species of Australian *Lyperanthus* can be conveniently divided into two groups based on morphological and biological features. Two species (*L. suaveolens* R. Br. - the designated type of the genus (Clements 1989) and *L. serratus* Lindl.) have narrow, erect, linear leaves with incurved to involute margins and a waxy-pruinose adaxial surface and the plants flower without the advent of fire or disturbance. The other two species (*L. nigricans* R. Br. and *L. forrestii* F. Muell.) have broadly ovate to orbicular, ground-hugging leaves, pellucid adaxially, with entire margins and the plants flower only after fire or a disturbance such as mowing or grazing.

After an anatomical study of leaves, Pridgeon (1994) found differences in a number of characters between *Lyperanthus nigricans* on the one hand and *L. suaveolens* and *L. serratus* on the other; the presence or absence of trichomes (papillae on both leaf surfaces of *L. nigricans*, absent in *L. suaveolens* and *L. serratus*); cuticular sculpturing (crinkled on both surfaces in *L. nigricans*, whereas in *L. suaveolens* and *L. serratus* it is smooth with a waxy bloom adaxially and papillate abaxially); anticlinal epidermal walls are sinuous on both surfaces in *L. nigricans*, sinuous abaxially in *L. suaveolens* and *L. serratus*; palisade mesophyll is abaxial in *L. suaveolens* and *L. serratus*, adaxial in *L. nigricans*; outer epidermal cells (prominently thickened on the abaxial surface in *L. suaveolens* and *L. serratus*, not so in *L. nigricans*); and distribution of stomata (amphistomatic in *L. nigricans*, hypostomatic in *L. suaveolens* and *L. serratus*).

Mycorrhizal studies also show differences in associations between the Australian species of *Lyperanthus*. One of us (MAC) isolated a distinctive endophyte with bright pink hyphae (*Tulasnella* sp.) from *L. suaveolens* plants collected at Batemans Bay, New South Wales. In symbiotic seed sowing tests this fungus stimulated germination of *L. suaveolens* and *L. serratus* but did not influence *L. nigricans* (or *L. antarcticus*). Differences in fungal endophytes between *L. serratus* and *L. nigricans* have also been found by Ramsay *et al* (1986).

Embryological data from all members of the *Lyperanthus* alliance, and a cladistic analysis of the Diuridae support the notion that two distinct genera are involved (Clements in prep.; Clements & Jones in prep.).

Hopper & Brown (*in* Hoffman & Brown 1993) informally proposed that *Lyperanthus nigricans* and *L. forrestii* be transferred to the monotypic genus *Burnettia* Lindl. based on phenetic studies. We dispute this placement. Embryological data show that *Burnettia* is more closely related to *Lyperanthus* *sensu stricto* than it is to *L. nigricans* and *L. forrestii* (Clements in prep.). Morphological differences in the leaves of *Burnettia* (actually reduced leaf bracts) and those of three species of *Lyperanthus* have been noted by Pridgeon (1994), and our studies show that *Burnettia* is monocarpic as well as being saprophytic. For these reasons we believe *Burnettia* should be maintained as a monotypic genus and a new genus is needed to accommodate *L. nigricans* and *L. forrestii*.

Pyrorchis D.L. Jones & M.A. Clem., *gen. nov.* TYPE: *Lyperanthus nigricans* R. Br.

Herba terrestris; tubera ovoidea. Folia basalia, 1-3, convoluta, prostrata, sessilia, latiora quam longa prope, stomata foliis utrinque. Inflorescentia racemiflora, gracilis, uniflora vel pauciflora. Flores resupinati, pedicellati,

aperti late aliquantisper longe, tristes. Sepalum dorsale librum, latiore quam sepala lateralialia. Sepala lateralialia libra. Petala libra. Labellum librum, columna basi cardatum, trilobatum; lobi laterales elliptici; lobus intermedius brevis, margine crenulato vel lacerato. Callus laminae instar cristae catilliformae centralis, in callos irregulares dividens distaliter. Columna angusta, incurvata, alis adnatis vestigialibus angustis. Pes columnae absens. Pollinia 4, libra. Stigma librum. Rostellum ventrale. Capsula erecta.

Terrestrial herbs growing in loose colonies, sympodial, flowering after fire or disturbance. Root tubers ovoid, wrinkled, solitary on each plant, with replacement tubers present, daughter root tubers produced at the apex of long stoloniferous roots. Leaves basal, 1-3, convolute, ground-hugging, sessile, nearly as wide as long. Inflorescence a terminal raceme, 1-few-flowered, wiry. Flowers resupinate, pedicillate, opening widely for long periods, dull-coloured, leathery, mildly fragrant. Tepals of similar length, without a terminal osmophore. Dorsal sepal free, broader than the lateral sepals, cucullate. Lateral sepals free. Petals free. Labellum free, lacking a claw, hinged to the base of the column, 3-lobed; lateral lobes elliptical; mid-lobe short, margins crenulate or lacerate. Lamina callus consisting of a central, plate-like ridge, breaking up distally into irregular calli; small calli scattered over the labellum surface. Column narrow, incurved, with narrow, adnate, vestigial wings. Column foot absent. Anther obliquely erect to decumbent. Pollinia 4, free. Stigma entire. Rostellum ventral. Capsule erect.

A genus of two species endemic in southern Australia. The generic name is derived from the Greek *pyr* (fire) and *Orchis*, another genus of Orchidaceae, but which is also often used generally when referring to an orchid.

Pyrorchis nigricans (R. Br.) D.L. Jones & M.A. Clem., *comb. nov.* BAsIONYM: *Lyperanthus nigricans* R. Br., *Prodr. Fl. Nov. Holl.* 325. 1810. TYPE: AUSTRALIA. Port Jackson, Sydney, Oct. 1803, *R. Brown* (LECTOTYPE: BM!). Port Jackson, South Head Road, 1805, *R. Brown* (Syntypes: BM!,E!,L!,P!).

SYNONYMS: *Caladenia nigricans* (R. Br.) H.G. Reichb., *Beitr. Syst. Pflanzenk.* 67 (1871). *Lyperanthus nigricans* R. Br. forma *typica* Domin, *J. Proc. Linn. Soc., Bot.* 41:250 (1912), *nom. illeg.*

Lyperanthus nigricans R. Br. forma *pumila* Domin, *J. Proc. Linn. Soc., Bot.* 41:251 (1912). TYPE: Mt Toolbrunup, 1909, *A. Dorrien-Smith s.n.* (HOLOTYPE: K!).

ILLUSTRATIONS: W.H. Nicholls, *Orchids of Australia*, complete ed., plate 203 (1969), as *Lyperanthus nigricans*; P. Palmer in W.M. Curtis, *The Students Flora of Tasmania*, part 4A, plate 15 (1979), as *Lyperanthus nigricans*; J.P. Jessop & H.R. Toelken (eds.), *Flora of South Australia* part 4, 2094

(1986), as *Lyperanthus nigricans*; D.L. Jones, *Native Orchids of Australia*, 166 (1988), as *Lyperanthus nigricans*; R.J. Bates & J.Z. Weber, *Orchids of South Australia*, 116 & 1127 (1990), as *Lyperanthus nigricans*; N. Hoffman & A. Brown, *Orchids of South-west Australia*, 223 (1993), as *Burnettia nigricans* ined.

DISTRIBUTION AND HABITAT: Australia: northern and southern New South Wales, southern Victoria, larger Bass Strait islands, Tasmania (including southern areas), southern South Australia and south-western Western Australia. Grows in a wide range of habitats including heathland, dry sclerophyll forest, woodland, mallee shrubland, and on granite outcrops.

Pyrorchis forrestii (F. Muell.) D.L. Jones & M.A. Clem., *comb. nov.* **BA-
SIONYM:** *Lyperanthus forrestii* F. Muell., S. Sci. Rec. 2(3):55 (1882).
TYPE: AUSTRALIA. Near the Stirling Range, *J. Forrest* (HOLO-
TYPE: K!).

SYNONYM: *Fitzgeraldia forrestii* (F. Muell.) F. Muell., S. Sci. Rec. 2:56, *in obcs.* (1882).

ILLUSTRATIONS: W.H. Nicholls, *Orchids of Australia*, complete ed., plate 202 (1969), as *Lyperanthus forrestii*; D.L. Jones, *Native Orchids of Australia*, 166 (1988), as *Lyperanthus forrestii*; N. Hoffman & A. Brown, *Orchids of South-west Australia*, 222 (1993), as *Burnettia forrestii* ined.

DISTRIBUTION AND HABITAT: Australia: endemic to south-western Western Australia from just north of Augusta east to Cheyne Beach, east of Albany. Grows in low-lying areas which are seasonally inundated, particularly close to swamps.

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